Leptopsylla algira costai (Siphonaptera: Leptopsyllidae): New host and new geographical record

Ali Yousefi1*, Mohammad Naser Ghorbani2, Sadegh Salehi-Guilande3
1Young Researchers and Elites Club, Science and Research Branch, Islamic Azad University, Tehran, Iran
2Department of Microbiology, Science and Research Branch, Islamic Azad University, Tehran, Iran
3Department of Pathobiology, School of Veterinary Science, Bu-Ali Sina University, Hamedan, Iran

ARTICLE INFO

Article history:
Received 29 Sep 2016
Accepted 26 Oct 2016
Available online 10 Nov 2016

Keywords:
Flea
Siphonaptera
Parasite
Crocidura leucodon
Iran

ABSTRACT

Objective: To access the emerging ectoparasites associated with shrews in Hamedan Province of Iran.
Methods: We have captured bicoloured white-toothed shrews [Crocidura leucodon (C. leucodon)] using the live traps in April 2014. Ectoparasites collected by brushing the skins and preserved in 70% ethanol containing 5% glycerin, and subsequently they were sent to the parasitology laboratory and processed. The fleas isolated from infested specimen were cleared in 10% aqueous potassium hydroxide, dehydrated in ethanol, cleared in xylene, mounted in Canada balsam and identified using reliable keys.
Results: In general, eight fleas (one male, seven females) were collected from C. leucodon in Hamedan Province, Western Iran. The fleas were identified as Leptopsylla algira costai Smit, 1955.
Conclusions: Fleas are medically important because they transmit a wide variety of diseases to their hosts. In addition, this article reports Leptopsylla algira costai for the first time in new host (C. leucodon) and new geographical region (Iran).

1. Introduction

The order Siphonaptera comprises 2500 species and subspecies in 239 genera. Adult fleas are obligatory parasites of warm-blooded vertebrates and 94% of the known species occur on mammals, while the remaining 6% are on birds. Fleas are important as vectors of disease organisms, including murine typhus and plague, and the remaining 6% were on birds. In addition, this article reports Leptopsylla algira costai for the first time in new host (C. leucodon) and new geographical region (Iran).

2. Materials and methods

The collection of shrews (C. leucodon) was done using live traps in April 2014. We observed C. leucodon which were infested with fleas during the study on ectoparasites in shrews in Razan Plain (Hamadan Province) located in the west of Iran (35°21’ N, 49°04’ E). Eight fleas (1 male, 7 females) were collected by brushing the skin and preserved in 70% ethanol containing 5% glycerin, and subsequently cleared in 10% aqueous potassium hydroxide then rinsed several times in distilled water to remove all traces of clear solution. The specimens were then dehydrated in increasing concentrations of ethanol, cleared in xylene and mounted in Canada balsam and the fleas were identified using the keys of Hopkins and Rothschild[5].

3. Results

The infested shrew was identified as C. leucodon using the keys of small mammals. Eight fleas (1 male, 7 females) were collected by brushing the skin and identified with aid of Hopkins and Rothschild keys[5]. Characters used to identify L. a. costai Smit, 1955 were described as follows. In Leptopsylla genus, the genal comb were usually composed of three or four spines, but in two species Leptopsylla sexdentata and Leptopsylla putoraki, their genal combs were composed of five or six spines. In our finding, Leptopsylla had three spines in the genal comb in the male (Figure 1A) and female (Figure 1B). Morphological characteristics of male specimens were as follows: without a dorsal process of any significance between the groups of antepygidial setae on the left and right sides, antepygidial bristles of each side were divided into two groups by a sinus which...
was narrow (Figure 2A); processes of male clasper were relatively short and their tips were not darkened by sclerotization; fixed process broadened priapically; apex of movable process was strongly truncated (Figure 2B). In females, the upper seta of the lower pair of antepygidial setae on each side was about half as long as the lower seta and sinus of antepygidial bristles was broad (Figure 3A), and sinus of the seventh sternite was much narrower, usually about as wide as deep (Figure 3B).

In fact, most L. a. costai have been reported from Israel and only one report is available from Turkey[8]. All previous records of this subspecies have been described in Mus musculus[7] and have been recorded also in Crocidura suaveolens[9], Rattus rattus, Meriones shawi and Meriones tristrami[10,11], Gerbillus gerbillus from Israel[12] and in Crocidura sp. from Turkey[8].

These data provide new information on new hosts and new geographical distribution of L. a. costai in the World. The study underlined the necessity of further investigation about the parasitological study in various microclimates to prepare a comprehensive list of Siphonaptera fauna and understanding of their possible role in disease transmission in Iran.

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgments

The author is thankful to Dr. Irina S Khokhlova for their kind collaboration in providing some key references. This study was funded by the Science and Research Branch of Islamic Azad University, Tehran, Iran.

References